

**WHAT IS CLAIMED IS:**

1. A broadband inductor assembly comprising:

a conical coil inductor having a broad end with radius  $r_1$  and a narrow end with radius  $r_2$ , the conical coil inductor also having a broad end terminal and a narrow end terminal;

5 a base; and

at least one support, such that the conical coil inductor is supported by the at least one support above the base at a distance greater than or equal to  $r_1$  from the base.

2. The broadband inductor assembly of claim 1, wherein the narrow end terminal of  
10 the conical coil is positioned at a minimum height above a substantially flat surface of the base.

3. The broadband inductor assembly of claim 1, wherein the narrow end is operable  
15 to provide a high end of an operational band of frequencies for a broadband inductor assembly.

4. The broadband inductor assembly of claim 1, wherein the broad end is operable to  
provide a low end of an operational band of frequencies for a broadband inductor  
20 assembly.

5. The broadband inductor assembly of claim 1, wherein the base includes a  
substantially flat surface.

6. The broadband inductor assembly of claim 1, wherein the conical coil inductor is  
25 supported by the at least one support such that such that an imaginary center line through the conical coil is substantially parallel to the base, and also such that the broad end of the conical coil is supported above the base.

7. The broadband inductor assembly of claim 1, wherein the at least one support is

composed of a low loss dielectric material.

8. The broadband inductor assembly of claim 7, wherein the at least one support is composed of glass.

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9. The broadband inductor assembly of claim 7, wherein the at least one support is composed of ceramic.

10. The broadband inductor assembly of claim 1, further comprising:

10 a cylindrical winding extension coupled to the broad end of the conical coil inductor.

11. The broadband inductor assembly of claim 1, further comprising:

15 a magnetic core inductor coupled in series to the broad end of the conical coil inductor.

12. An ultra broadband bias tee, comprising:

a broadband inductor assembly, including:

20 a conical coil inductor having a broad end with radius  $r_1$  and a narrow end with radius  $r_2$ , the conical coil inductor also having a broad end terminal and a narrow end terminal;

a base; and

25 at least one support; such that the conical coil inductor is supported above the base at a distance greater than or equal to  $r_1$  from the substantially flat surface of the base; and

a DC block assembly coupled to the broadband inductor assembly.

13. The ultra broadband bias tee of claim 12, wherein the DC block assembly includes an ultra broadband capacitor assembly.

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14. The ultra broadband bias tee of claim 12, wherein the narrow end terminal of the

conical coil is positioned at a minimum height above a substantially flat surface of the base.

15. The ultra broadband bias tee of claim 12, wherein the narrow end is operable to provide a high end of an operational band of frequencies for a broadband inductor assembly.

16. The ultra broadband bias tee of claim 12, wherein the broad end is operable to provide a low end of an operational band of frequencies for a broadband inductor assembly.

17. The ultra broadband bias tee of claim 12, wherein the base includes a substantially flat surface.

18. The ultra broadband bias tee of claim 12, wherein the conical coil inductor is supported by the at least one support such that an imaginary center line through the conical coil is substantially parallel to the base, and also such that the broad end of the conical coil is supported above the base.

19. The ultra broadband bias tee of claim 12, wherein the at least one support is composed of a low loss dielectric material.

20. The ultra broadband bias tee of claim 19, wherein the at least one support is composed of glass.

21. The ultra broadband bias tee of claim 19, wherein the at least one support is composed of ceramic.

22. The ultra broadband bias tee of claim 12, wherein the broadband inductor assembly further comprises:

a cylindrical winding extension coupled to the broad end of the conical coil

inductor.

23. The ultra broadband bias tee of claim 12, wherein the broadband inductor assembly further comprises:

5           a magnetic core inductor coupled in series to the broad end of the conical coil inductor.

24. The ultra broadband bias tee of claim 12, wherein the DC block assembly is integrated into a coplanar waveguide.